Patent Claims

1. Method for generating a predetermined breaking line in a one-layer planar extending article with a working side (6) and a decorative side (5), comprising a material with an inhomogeneous material density distribution, wherein a laser beam bundle (4) is directed to the working side (6) and, by means of removing material in its beam path, generates holes that are invisible from the decorative side (5), the laser beam bundle (4) and the planar extending article carry out a relative movement with respect to one another so that the holes are generated in a row along the desired predetermined breaking line, the laser beam is switched off for a period of time determining the subsequent hole spacing when an amount of radiation generating a detector signal that is greater than a predetermined threshold signal impinges on a detector (7) arranged on the decorative side (5), the output of the laser beam is gradually increased from zero to its maximum nominal value before starting to produce each hole, wherein the laser beam is switched off immediately when a detector signal that is greater than the predetermined threshold is generated before reaching the maximum nominal value, which is caused by the absence of material or by a small amount of material of the planar extending article in the beam path (pseudo-hole) and prevents removal of the small amount of material and prevents overloading of the detector 7.

2. Method for generating a predetermined breaking line in a multiple-layer planar extending article with a working side (6) and a decorative side (5), in which the layer (final layer) forming the decorative side (5) comprises an inhomogeneous material, wherein a laser beam bundle (4) is directed to the working side (6) and, by means of removing material in its beam path, generates holes that are invisible from the decorative side (5), the laser beam bundle (4) and the planar extending article carry out a relative movement with respect to one another so that the holes are generated in a row along the desired predetermined breaking line, the laser beam is switched off for a period of time determining the subsequent hole spacing when an amount of radiation generating a detector signal that is greater than a predetermined threshold signal impinges upon a detector (7) arranged on the decorative side (5), prior to penetration of the laser beam into the final layer the output of the laser beam is reduced at least until the amount of radiation still being emitted generates a signal smaller than the threshold with full detection, the detector (7) is activated and the laser beam is

subsequently increased again gradually to its maximum nominal value, wherein the laser beam is switched off immediately when a detector signal that is greater than the predetermined threshold is generated before reaching the maximum nominal value, which is caused by the absence of material or by a small amount of material of the planar extending article in the beam path (pseudo-hole) and prevents removal of the small amount of material and prevents overloading of the detector 7.

3. Method according to claim 2, characterized in that a preparatory cut is introduced along the desired predetermined breaking line from the working side (6) to, at most, the final layer before generating the row of holes, wherein the detector (7) is desensitized or deactivated in order to protect it from possible overload.

4. Method according to claim 1, 2 or 3, characterized in that the threshold signal is selected in such a way that it is generated already by an amount of radiation that transmits through a residual wall of material of the planar extending article so that the holes are formed as blind holes.

5. Method according to claim 1, 2 or 3, characterized in that when working an inhomogeneous material that is a textile surface having an open structure on the decorative side (5), the threshold signal is selected in such a way that an amount of radiation that generates a signal greater than the threshold signal is not detected until after the direct penetration of the decorative side (5) so that the holes are formed as microperforations.

6. Method according to claim 4 or 5, characterized in that the laser beam impinges on the working side (6) at an angle of less than 90° relative to the direction of the predetermined breaking line in order to increase the length of the beam path in the planar extending article, which leads to removal of a greater amount of material with hole spacing remaining constant or allows greater hole spacing.

7. Method according to one of the preceding claims, characterized in that the selected hole spacing between a pseudo-hole and a subsequent blind hole or microperforation is less than the other hole spacings.

8. Method according to one of the preceding claims, characterized in that the laser beam bundle (4) is shaped in such a way on the working side (6) that its cross section decreases toward the decorative side (5).

9. Method according to one of the preceding claims, characterized in that when working an inhomogeneous material that is a woven material (1) comprising longitudinal threads (3) and cross threads (2), the selected hole spacing is less than the thread diameter.

10. Method according to claim 9, characterized in that the selected hole spacing is equal to half of the thread diameter so that each thread is weakened by two holes insofar as the hole is not generated over the thread diameter.